

Executive Summary
SUISUN MARSH PROPERTY ACQUISITION
AND HABITAT RESTORATION

A Pilot Project to Implement Findings of the CALFED Suisun Marsh Levee Investigation Team

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Amount Requested: \$536,750

Implementation Participants/Collaborators: Participants are the Suisun Marsh Environmental Coordination Advisory Team (ECAT) which includes DWR, DFG, USBR, and SRCD with the USFWS and ACOE in an advisory role.

Project Description: The Suisun Marsh Property Acquisition and Habitat Restoration Project is a proposal to acquire a seasonally managed parcel in the Suisun Marsh that fit selected criteria, conduct pre-project monitoring, and restoration planning. In addition, this is a pilot project to implement findings of the CALFED Suisun Marsh Levee Investigation Team, which will model the parcel to determine the effects of tidal conversion on water quality within the Suisun Marsh and Sacramento-San Joaquin Delta. This proposal includes the initial phases of a multi-phase project to restore natural ecosystem processes to a degraded system.

Hypothesis: Restoring seasonally managed wetlands in Suisun Marsh to tidal marshes that include a low-marsh, high-marsh, and upland transition zone will aid in the recovery of listed and special status plant and animal species occurring in the Suisun Marsh and will improve water quality in the Sacramento-San Joaquin Delta.

Primary Benefits: This project will benefit the Suisun Marsh / San Francisco Bay Ecological Management Zone by restoring land in the northern Suisun Marsh to tidal marsh. The restoration of this property will benefit listed Suisun Marsh species including but not limited to Suisun thistle, soft bird's beak, and Masons lilaeopsis, delta smelt, Sacramento splittail, California clapper rail, California black rail, salt marsh harvest mouse, and other listed and special status species. The project will also provide water quality benefits to the Delta.

Proposed Approach: Our basic approach is to acquire a parcel in the western or Northern Marsh that has been leveed off from tidal influence and is suitable for restoration. We will promote the development of a self-sustaining functional marsh ecosystem through restoration of natural edaphic, topographic, and tidal features.

Coordination with CALFED ERPP Goals: This project will help promote five of the six Ecosystem Restoration Strategic Goals. Goal 1-At Risk Species; This project will aid in the recovery of several listed Suisun Marsh species. Goal 2-Ecosystem Processes and Biotic Communities. To restore the natural tidal processes so that the parcel can develop into a self-sustaining tidal marsh ecosystem; Goal 4-Habitats. Restoring functional habitat values to these areas in Suisun Marsh will support the recovery and restoration of native species and communities including listed and at-risk species. Goal 5- Non-native Invasive Species. Long term management strategy of the restored area will include actions to reduce or eliminate invasive species; Goal 6 - Water quality. Restoration of tidal function to managed wetlands, through controlled levee breaches will improve delta water quality. ERPP goals specifically targeted tidal restoration to 5000-7000 acres of managed wetlands in the Suisun Marsh. The project will address uncertainties related to shallow water, tidal, and freshwater marsh habitats.

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PROJECT DESCRIPTION

1. Statement of Problem

a. Problem: Historically, the Suisun Bay and Marsh included about 68,000 acres of tidal wetlands. From the mid-1880s to the early 1900s, over 90 percent of these wetlands were reclaimed for agriculture. Agricultural production and success was limited due to increased salinity in Suisun Bay/Marsh region. Today, most of the levees originally constructed for agricultural reclamation now form part of the infrastructure for managing water levels in seasonal non-tidal (managed) wetlands (Goals Project, 1999). Suisun Marsh is the largest contiguous brackish water marsh remaining in the United States and the Estuary's largest contiguous protected area.

The loss of natural flows and topographic features has led to the loss of significant tidal marsh habitats in the region, including a reduction of natural tidal sloughs and emergent tidal wetlands. These habitats are critical spawning and rearing habitats for many aquatic species, including delta smelt and Sacramento splittail. The loss of the tidal access has hindered the ecological processes and functions critical for sustaining a healthy aquatic ecosystem and have created a lack of support for the Bay-Delta aquatic foodweb contributing to unhealthy fish populations. These natural sloughs also provide important nesting and feeding habitat for avian species. Much of the remaining tidal acreage is fragmented and reduced to narrow strips between sloughs and levees and lack any adjacent upland transition habitat. Reduction and fragmentation of marsh habitats has resulted in reduced populations of California clapper rail, salt marsh harvest mouse, and rare plants dependent on high tidal marsh and adjacent upland transition.

Reclamation of tidal wetlands has reduced the tidal prism and affected water quality in the Sacramento-San Joaquin Delta. The physical geometry and vegetation assemblages of the pre-altered Suisun Marsh likely created conditions which dissipated tidal range and reduced salinity intrusion in Suisun Bay and the Delta. Removal of lands from tidal action has increased tidal prism and induced salt mixing.

The Suisun Marsh Protection Plan, passed in 1977, identifies tidal marsh restoration as an implementation measure to protect wildlife and its habitat in the Suisun Marsh. The CALFED Ecosystem Restoration Program Plan (ERPP) stated a goal of restoring tidal action to 5000-7000 acres in the Suisun Bay and Marsh (ERPP, 1999). This project is also consistent with the findings of the Regional Habitat Wetland Goals Project (Goals Report, 1999).

The Suisun Marsh Preservation Agreement was signed in 1987 by DWR, DFG, USBR and SRCD and focused on the construction of large scale facilities and management actions to provide channel water salinity of adequate quality for waterfowl food plant production. Amendment Three of this agreement includes objectives for multi-species management in the Suisun Marsh and provides 3.2 million dollars towards tidal wetland habitat restoration. With CALFED funds to cost-share with these available funds, more tidal wetland habitat can be restored in the Suisun Marsh.

Objectives

The objectives of this proposal are to acquire property in the Suisun Marsh, along Hill Slough, currently managed as seasonal wetland and restore the area to a fully functioning self-sustaining tidal wetland ecosystem which includes low-marsh, high-marsh, and upland transition zones, increasing the area and contiguity of saline emergent wetlands thereby assisting in the recovery of at-risk species.

Additionally, this project is a pilot project to implement the findings of the CALFED Suisun Marsh Levee Investigation Team as to the extent of water quality benefits from controlled levee breaches in Suisun Marsh. Implementation of this project will aid in achieving the ERPP's vision and restoration target for Suisun Marsh.

This proposal covers the initial phases of a multi-phased project and includes;

- ☞ Acquisition of a parcel which meet the selection criteria.
- ☞ Hydrologic modeling to determine the location, size, and number of levee breaches to predict the extent of water quality benefits seen by tidal conversion
- ☞ Pre-project biological monitoring on the parcel
- ☞ Restoration planning

Conceptual Model: The conceptual model being used for this proposal predicts that when the when the topography and hydrology are restored, fully functioning tidal marsh habitats will form, and the populations of at-risk species will increase and utilize the site. The restored topographic and hydrologic features will determine the habitat types that are formed on the site. Native tidal marsh plant species will colonize the site in areas that match their living requirements. These marsh plant species will form communities, creating habitats. As habitats develop, Suisun Marsh fish and wildlife species will inhabit and utilize these restored habitats.

Hydrologic modeling conducted as part of the CALFED Suisun Marsh Levee Investigation Team has predicted that levee breaches of a certain size and at a certain location will result in lower salinity conditions in the regions of the Sacramento-San Joaquin Delta and changes in Suisun Marsh salinities (CALFED 2000). These modeling results pose uncertainties for this project because the breaches simulated were in different locations and for the most part, larger than the parcel we are proposing to convert. Parcels being considered for acquisition and tidal conversion can be modeled by the levee investigation team. The implementation team will utilize the results in the evaluation of property acquisition selection. Implementation of tidal habitat restoration will assist in validating the model.

There is uncertainty in the amount of time it takes for a fully functioning tidal wetland ecosystem to develop once the parcel is opened up to tidal action. This response depends on several factors, most notably the existing elevation of the parcel, and sediment loads of the tidal flows in the surrounding area. Elevations of managed wetlands in the marsh have natural variation depending on their location and soil type, the amount of subsidence that has occurred and pre-breach land use and management activities. There is uncertainty as to the extent of channel formation within the restored area and if listed or special status aquatic species will inhabit and utilize these channels.

The micro-topography and salinity regime within the restored tidal marsh will determine the plant species that will colonize the area. While salinities can be predicted using existing and pre-project monitoring evaluations, there is uncertainty as to the plant communities that will develop and if native plant species or exotic-invasive species will colonize. There is also uncertainties if listed and special status plant will be able to utilize the restored site and if the vegetation will be suitable to sustain Suisun Marsh listed wildlife species such as salt marsh harvest mice and California clapper rail.

These uncertainties are being addressed in this proposal and in the adaptive management and monitoring plans.

Hypothesis being tested: Restoring seasonally managed wetlands in Suisun Marsh to tidal marshes

including a low-marsh, high-marsh, and upland transition zone will aid in the recovery of listed and special status plant and animal species occurring in the Suisun Marsh and will improve water quality in the Sacramento-San Joaquin Delta. Testing this hypothesis through the acquisition and restoration of managed wetlands will address five of the six ERP's Strategic Goals.

Goal 1 - Achieve recovery of At-Risk Species: -Acquisition and restoration of seasonally managed (non-tidal) land in Suisun Marsh to tidal emergent wetland is expected to aid in the recovery of several listed and special status species dependent on Suisun Bay by restoring their natural habitat within their current range. Some of the species that will benefit from the tidal restoration of land in Suisun Marsh include (but are not limited to): Suisun thistle, soft bird's beak, Masons lilaeopsis, delta smelt, Sacramento splittail, California clapper rail, California black rail, and the salt marsh harvest mouse.

Goal 2 - Ecosystem Processes and Biotic Communities: Acquisition and tidal restoration of land in Suisun Marsh by levee breaching would allow the natural inundation processes to begin, which would lead to rehabilitation of natural functions and processes of a self sustaining tidal marsh ecosystem. Restoring natural processes will provide conditions that favor native species over exotic species. The development of shallow water habitat and critical upland transition zone habitat will provide habitat to at-risk species. The proposed restoration project will take an encompassing tidal marsh ecosystem approach.

Goal 4 - Habitats: This project will contribute to restoring large expanses of functional brackish tidal marsh and tidal perennial aquatic habitats. Restoring these habitats will aid in the recovery and restoration of native species and biotic communities in the Suisun Marsh.

Goal 5 - Non-Native Invasive Species: Restoring the natural tidal processes will provide habitat that supports colonization and dominance of native species. Research by DFG and others have shown that native fishes maintain higher relative abundance compared to non-native fishes in a tidal marsh (IEP, 1999)

Goal 6 - Sediment and Water Quality: This proposal is a pilot project to implement and validate the findings of the levee investigation team which predicts that controlled levee breaches in Suisun Marsh improves water quality in the Sacramento-San Joaquin Delta. Additionally tidal emergent wetlands filter toxics from receiving waters and allow sediments to settle and are an integral part of a healthy, functioning ecosystem.

This project is consistent with objectives of the ERPP, the Regional Habitat Wetland Goals project and Central Valley Improvement Act protections of habitat and fish and wildlife restoration goals in the Bay-Delta ecosystem. The proposed project also addresses uncertainties related to shallow water, tidal and freshwater marsh habitats identified by CALFED. Implementation goals are to restore the appropriate hydrology and topography of the site, allow natural regeneration, implement an extensive monitoring program, and controlling invasive, non-native species to better understand the tidal wetland regeneration process. We will also be able to assess the effectiveness of our modeling techniques in predicting the hydrology of the completed restoration project.

Adaptive Management: In the adaptive management process, the Suisun Marsh property acquisition and habitat restoration program falls under the Initiate Restoration Actions (4) Undertake Pilot/Demonstration projects category. The goals of recovering at-risk species and habitats were set forth by CALFED in the Ecosystem Restoration Strategic Goals. These goals were presented with the premise that at-risk species populations will inhabit or move into available

habitats if habitats are restored.

The restoration actions proposed will benefit from preliminary data being collected at other tidal restoration sites in the Bay-Delta ecosystem including Martinez Regional Shoreline Marsh Enhancement, Sonoma Baylands Marsh Restoration, Carl's Marsh, and Crissy Field Marsh restoration. However, each site has its own complex topography, hydrology and sedimentation rates and requires its own site-specific model specific. This proposal, along with the Hill Slough West Demonstration Project, will provide data to assess the accuracy of habitat development predictions and the feasibility of large-scale restoration activities in this region.

In addition, the CALFED Suisun Marsh Levee Investigation Team has conducted a preliminary investigation of controlled breaches in specific areas within Suisun and its effect on Delta water quality. The findings of the team predict that breaches of certain size and in specific areas of the Suisun Marsh results in lower channel water salinity in critical areas within the Sacramento -San Joaquin Delta. The findings also suggest localized changes (both increases and decreases) in Suisun Marsh salinities. These findings were corroborated and verified by a private consulting firm (RMA and Associates), specializing in this area. Additional hydrologic modeling will be conducted to assist in the selection of the parcel and size of breach required to restore the area(s) to a fully functioning tidal marsh while predicting the effects on channel water salinity in the Suisun Marsh and Sacramento-San Joaquin Delta. In addition, this proposal will help validate the findings of the levee investigation team. This data will be used as part of a restoration plan developed for the parcel.

The uncertainties addressed in this proposal including shallow water marsh and upland transition zone formation and channel dynamics will be addressed and included in the restoration plan to be developed in a subsequent phase of this project. Detailed hydrologic and topographic surveys will be conducted and compared with other restoration activities in the area to better predict sedimentation rates and time frames for tidal wetland restoration in Suisun Marsh. Adaptive management will be incorporated into the restoration and monitoring plan for the parcel. For example breach size can vary between parcels to compare breach size and sedimentation rates where applicable.

The restoration plan will include success standards and criteria for terrestrial and aquatic habitat development and detailed study plans will be developed. Pre-project monitoring will be conducted in the initial phase while the post-breach monitoring plan will be developed and implemented in a subsequent phase of the project. Detailed vegetation monitoring plan will be developed and conducted. Results from this monitoring will be used in conjunction with the Suisun Marsh Wide Vegetation Survey Protocol- A New Methodology (1999) being conducted by Dr. Todd Keeler-Wolfe (DFG, Natural Heritage Division) to assess changes in vegetation over time in the restored areas. Monitoring will target the identification of limiting factors that determine the distribution and abundance of selected wetland species of concern and threatened and endangered species for various inundation-salinity regimes. Invasive species control measures will be included in the restoration plan and adapted accordingly to achieve success. Invasive species control measures will be included in restoration plan for acquired parcels to address uncertainties.

Pre-project and post-breach monitoring for the endangered salt marsh harvest mouse will be conducted in conjunction with existing SMHM monitoring that is conducted annually on managed and tidal wetlands throughout the Suisun Marsh by DFG and DWR and reviewed by ECAT. A genetic study to positively identify salt marsh harvest mice and potential hybridization with western harvest mice is being conducted in managed wetlands in Suisun beginning summer 2000 and may be expanded to include the mice collected in restored areas. Monitoring plans for other terrestrial

and aquatic species will be developed and adapted to meet the targeted goals and objectives of the restoration project.

CALFED has targeted restoration in the Suisun Marsh as a priority in order to restore and connect tidal marsh habitats to allow the movement of special status species into restored areas.

2. Proposed Scope of Work

Location of Project: This project will occur in the Suisun Marsh/San Francisco Bay ecological zone, within the Suisun Marsh ecological management unit of CALFED, identified as area 2.1 in the PSP. The project is located in Solano County. Land in the western and northern portions of Suisun Marsh will be targeted for acquisition as shown on Figure 1. We have identified a parcel in the Hill Slough region in the northeastern Suisun Marsh, and a parcel along Chadbourne Slough (Figure 1). We have also targeted areas along Cordelia and Goodyear Sloughs in the western Marsh for land acquisition. These areas are consistent with areas described in the Regional Goals Project (1999) and the ERPP. Parcels available at the time of funding will be evaluated by established criteria and one will be selected for restoration.

Due to the time delay between proposal submittal and potential funding, identifying specific properties available for purchase is difficult. Properties available now may not be available when funding is expected in early spring 2001. Conversely, there may be additional properties available once funding becomes available. As of the date of submitting this proposal, we have identified two properties within Suisun Marsh that are currently available for purchase, and may still be available for acquisition once funding is secured. The landowners have contacted DFG, Grizzly Island Wildlife Area and have expressed an interest in selling.

Black Mallard Club (Ownership # 207) (Lat: 38 deg, 13' 39" N, Long: 121 deg. 58' 55" W) is located along the upper reaches of Hill Slough and shown on Figure 2. The club is a 262-acre parcel comprised of 126 acres of managed wetland, 54 acres of tidal wetland, and 72 acres of upland. Only minimal physical modifications would likely be required to restore tidal action. This parcel is also in the same general area of the Hill Slough West Habitat Restoration Demonstration project and adjacent to muted tidal wetlands owned by DFG and managed as part of the Grizzly Island Wildlife Area. Acquisition of a parcel in this location is consistent with ERPP goals of restoring large blocks of contiguous habitat.

Approximately 300 acres have been identified along Chadbourne Slough, west of the railroad track as being available for purchase. This acreage includes portions of Marsh Ownership 129 (Lat: 38 deg 11' 30", Long: 122 deg, 5' 30"). The location of this parcel is shown in Figure 3.

Parcels along Goodyear and Cordelia Slough in the western Suisun Marsh will also be targeted for acquisition, although no specific parcel has been identified at the time of proposal submission. The area targeted is shown in Figure 1.

Approach: This project will be conducted in 5 phases. We are requesting funding to complete Phases I and II and begin Phase III, if possible. If funds are available because land acquisition costs are less than estimated, the balance would be used to complete Phase III and begin Phase IV.

Phase I: Identify potential parcels for acquisition. Acquire approximately 500 acres of land in Suisun Marsh. ECAT has developed a list of criteria and method of evaluating parcels considered for acquisition and conversion to tidal wetlands. Parcels must include the potential to include low-marsh,

high marsh and upland transition zones. The exact location of parcels will depend on willing sellers but targeted areas include the Hill Slough area in the northeastern Suisun Marsh and along Chadbourne, Cordelia and Goodyear Sloughs in the western Marsh. These areas were targeted for the high potential benefit for native and at-risk species and are consistent with areas described in the Regional Goals Project (1999) and the ERPP. Potential flood risk to adjacent landowners is another condition to be considered in selecting parcels for acquisition and restoration.

The levee investigation team will conduct hydrodynamic modeling on parcels proposed for purchase to estimate the channel water salinity effects to the Marsh and Delta. Findings will be verified with a two dimensional model under contract with RMA and Associates.

Land will be purchased only from willing sellers. DWR Division of Right of Way staff will appraise the property and conduct all necessary activities to transfer ownership of the parcel. Prices offered for parcels will be in compliance with federal and state standards. Approximate land value in Suisun Marsh is \$1200/acre. A public outreach program will be conducted with the SRCD to inform landowners that we are looking to purchase suitable parcels in the target areas. Landowners will be contacted for permission to enter property and conduct appraisal. DFG will likely assume ownership of the property. Another option is for ownership to be transferred to Solano County Farmlands and Open Space Foundation who would manage the parcel in conjunction with their Rush Ranch property. An endowment fund would be established.

Pre-project vegetation monitoring and presence absence of listed species will be conducted during Phase II. The purpose of pre-project monitoring will be to evaluate which species currently utilize the site in its existing state. Presence/absence surveys of listed species will be conducted to assist in the permitting process.

Phase II: Develop a Restoration Plan. Conduct a topographic survey and hydrologic evaluation. An engineering-level restoration plan and refined cost estimate based on a thorough understanding of the site's hydrology and topography will be developed. We will develop and implement a pre-project monitoring program expanding on existing Suisun marsh monitoring efforts following the existing agency approved protocols. We will solicit public involvement in the development of the restoration plan.

A consultant with experience in successful tidal restoration projects and expertise in Suisun Marsh will be hired to perform the hydrologic evaluation and provide input into the development of a restoration plan.

The implementation team will conduct a detailed review of other restoration projects, both successful and not successful to utilize an adaptive management approach in the development of the restoration plan for the acquired parcel or parcels. The implementation team will solicit participation from the SRCD members and landowners in the vicinity of restoration activities to develop a plan that is mutually beneficial and does not increase flood risk or their ability to manage for waterfowl.

Phase III: Complete environmental documentation and obtain necessary permits. All environmental documents will be prepared in compliance with CEQA, NEPA, ESA and CESA. Public involvement will occur during this Phase through the permitting process.

Phase IV: Execute the restoration plan and initiate adaptive management. To execute the restoration plan, levees will be breached according to the findings of the hydrologic and topographic evaluations, and restoration plan. Adaptive management will be utilized as results become available as to the progress of the project towards the goal of achieving a self-sustaining, fully functioning tidal marsh. If

success criteria are not being met, then plans can be altered to address the issues and incorporate new information.

Phase V: Implement the monitoring plan of the developing emergent wetland.

Monitoring and Assessment Plans: The monitoring component of the project will be developed in Phase II and will be presented with the conceptual restoration plan. A quality assurance component will be included in the monitoring plan. Monitoring will include but not be limited to fisheries occurrence in the restored tidal wetland, wildlife use patterns in the restored areas and vegetation monitoring of plant composition, growth, trends, and recruitment throughout the restoration area. Several testable hypotheses, related to fish and wildlife use of the restored tidal wetland, will be developed as part of the monitoring plan as will hypotheses on the vegetative composition, native vs. invasive species dominance and colonization by special status species.

Results from existing monitoring will be used to complement site -specific monitoring on restored parcels in Suisun Marsh. Existing monitoring efforts in the Suisun Marsh are quite extensive. DWR currently conducts water quality monitoring and maintains an extensive network of salinity and tide stage recorders in the Suisun Marsh. UC Davis conducts fisheries monitoring, under contract with DWR. DFG and DWR conduct annual salt marsh harvest mouse surveys on State owned land (both tidal and managed), and ECAT has implemented a New Marsh-wide Vegetation Survey, developed and being conducted by DFG's Natural Heritage Division.

The restoration plan will include detailed study plans, success standards and criteria for terrestrial and aquatic habitat development. Pre-project monitoring will be conducted in the initial phase while the post-breach monitoring plan will be developed and implemented in a subsequent phase of the project. A detailed vegetation monitoring plan will be developed and conducted.. Monitoring will target the identification of limiting factors that determine the distribution and abundance of selected wetland species of concern and threatened and endangered species for various inundation-salinity regimes. Invasive species control measures will be included in the restoration plan and adapted accordingly to achieve success. Invasive species control measures will be included in restoration plan for acquired parcels to address uncertainties. Results from this monitoring will be used in conjunction with the Suisun Marsh Wide Vegetation Survey (DFG, 1999) conducted by Dr. Todd Keeler-Wolfe (DFG, Natural Heritage Division) to assess changes in vegetation over time

Pre-project and post-breach monitoring for the endangered salt marsh harvest mouse will be conducted in conjunction with existing SMHM monitoring that is conducted annually on managed and tidal wetlands throughout the Suisun Marsh by DFG and DWR. A genetic study to positively identify salt marsh harvest mice and potential hybridization with western harvest mice is being conducted in managed wetlands in Suisun beginning summer 2000 and will be expanded to include the mice collected in restored areas. Monitoring plans for other terrestrial and aquatic species will be developed and adapted to meet the targeted goals and objectives of the restoration project.

Water quality monitoring will be conducted in the adjacent sloughs in conjunction with existing water quality monitoring program. If necessary, a salinity/tide stage recorder may be installed at the project site. Fisheries occurrence in the restored wetland will be monitored and the plan will be developed in Phase II.

Data Handling and Storage: All data will be compiled and stored by Ms. Terri Gaines, Environmental Specialist with the Suisun Marsh Branch of the California Department of Water Resources. All data will be collected with GIS coordinates to facilitate GIS data layer development. Progress and data will be made accessible through the IEP webpage, and through the project email

reflector.

Expected Products/Outcomes: Expected products of Phases I and II will include acquisition, in fee title or conservation easement (from willing sellers) of approximately 250-500 acres in Suisun Marsh, reports from hydrodynamic modeling of these parcels with predictions as to expected channel water salinity changes as a result of restoration. A topographic and hydrologic survey will also be delivered leading to the development of detailed restoration and monitoring plans for acquired parcels. Status reports will be forwarded to CALFED and disseminated on the project email reflector.

Work Schedule: The following specific tasks are needed to Implement Phases I and II and are expected to take place within 36 months of funding. Details of these tasks are provided in the Budget section:

- ◆ Task 1: Project Management: Completion Date: Year 1. Deliverables: CALFED status reports.
- ◆ Task 2: Form an advisory or steering group: Completion Date: Year 1. Deliverable: list of properties to acquire.
- ◆ Task 3: Land Acquisition: Completion Date: Year 1 or 2. Deliverables: purchase contract and agreements.
- ◆ Task 4: Integration with Suisun Marsh Levee Investigation Team. Completion Date: Ongoing activity during Years 1-3. Deliverable: Modeling results.
- ◆ Task 5: Develop pre-project monitoring plans. Completion Date: Year 2. Deliverables: monitoring plans.
- ◆ Task 6: Develop a restoration plan. Completion Date: Year 3. Deliverables: Restoration plan.
- ◆ Task 7: Begin environmental compliance and permitting: This is a Phase III activity that may begin during year 3.

Inseparable tasks: Tasks one through 5 are inseparable and will serve as the foundation of the success of this tidal wetlands restoration effort. Task 6 will be conducted once the parcel or parcels are selected. Task 7 is crucial to ensure the project is implemented successfully and can serve as a demonstration project for future large-scale restoration efforts. Phases IV (Implementation) and Phase V (Monitoring) will begin once Phases I through III are completed.

Feasibility: This project is feasible in that we have identified at least two willing sellers in the project area. However, actions towards purchasing any specific parcels cannot begin until funding is secured. Once funding is secured through acceptance of this proposal, the implementation team will work through the SRCD to solicit additional willing sellers in the targeted area. Through the CEQA and NEPA process, implementation issues will be addressed and resolved. The environmental checklist, submitted as part of this proposal package, is the initial step towards CEQA and NEPA compliance.

APPLICABILITY TO CALFED ERP GOALS

1. ERP Goals

Goal 1 - Achieve recovery of At-Risk Species: -Acquisition and restoration of seasonally managed (non-tidal) land in Suisun Marsh to tidal emergent wetland is expected to aid in the recovery of several listed and special status species dependent on Suisun Bay by restoring their natural habitat within their current range. Some of the species that will benefit from the tidal restoration of land in Suisun Marsh include (but are not limited to): Suisun Marsh listed and sensitive plant species, delta smelt, Sacramento splittail, California clapper rail, California black rail, and the salt marsh harvest mouse.

The project will help address the general target for the tidal brackish marsh special-status plant species of maintaining genetic diversity, preventing species extirpation by from localized catastrophic occurrences, and promoting the sustainability of each species. Two plant species that could benefit the most are soft bird's-beak and Suisun thistle. Attachment A shows the contribution this makes to visions, programmatic actions, and objectives of the ERPP.

Goal 2 - Ecosystem Processes and Biotic Communities: Acquisition and tidal restoration of land in Suisun Marsh by levee breaching would allow the natural inundation processes to begin, which would lead to rehabilitation of natural functions and processes of a self sustaining tidal marsh ecosystem. Restoring natural processes will provide conditions that favor native species over exotic species. The development of shallow water habitat and critical upland transition zone habitat will provide habitat to at-risk species. The proposed restoration project will take an encompassing tidal marsh ecosystem approach. Detailed hydrologic and topographic surveys will be conducted in Phase II so that sedimentation and tidal regimes may be accurately modeled and predicted. These surveys will also aid in predicting the self-sustaining habitats that will form on the site.

Goal 4 - Habitats: This project will contribute to restoring large expanses of functional brackish tidal marsh and tidal perennial aquatic habitats. Restoring these habitats will aid in the recovery and restoration of native species and biotic communities in the Suisun.

Goal 5 - Non-Native Invasive Species: Restoring the natural tidal processes will provide habitat that supports colonization and dominance of native species, thus reducing the colonization of non-native invasive species in the area. The restoration and management plan will address this goal.

Goal 6 - Sediment and Water Quality: This proposal is a pilot project to implement the findings of the levee investigation team which predicts that controlled levee breaches in Suisun Marsh improves water quality in the Sacramento-San Joaquin Delta. This project will assist in validating these findings. Additionally tidal emergent wetlands filter toxics from receiving waters and allow sediments to settle and are an integral part of a healthy, functioning ecosystem.

This project is consistent with objectives of the ERPP, the Regional Habitat Wetland Goals project and CVPIA protections of habitat and fish and wildlife restoration goals in the Bay-Delta ecosystem.

The proposed project also addresses uncertainties related to shallow water, tidal and freshwater marsh habitats identified by CALFED. The project planning is concentrated on restoring the appropriate hydrology and topography of the site and allowing natural regeneration. By allowing natural regeneration, implementing an extensive monitoring program, and controlling invasive, non-native species we will better understand the tidal wetland regeneration process and the spread of invasive species. We will also be able to assess the effectiveness of our modeling techniques in

predicting the hydrology of the completed restoration project.

The proposed project is compatible with the objectives of the other CALFED programs and does not conflict with any of the potential water supply and storage conveyance alternatives. The proposed project address objectives of the Water Quality Program and Levees Program. The proposed project is a pilot project to implement the findings presented by the CALFED Suisun Marsh Levee Breach Modeling Study which indicate that levee breaches of specific size and in specific locations lower channel water salinity in the Sacramento-San Joaquin Delta. Levees in Suisun Marsh are now included in the CALFED levees program and should be considered in the implementation of ERPP objectives.

2. Relationship to Other Ecosystem Restoration Projects

If the property on Hill Slough is selected for acquisition, this parcel is in the same region as the Hill Slough West Habitat Restoration Demonstration Project funded in an previous CALFED grant. The identified parcel is also adjacent to muted tidal wetlands owned by the Department of Water Resources. Acquiring an additional parcel in this area or restoring property in the western Marsh would work toward the ERPP objective of restoring large blocks of contiguous habitat as would other projects submitted for habitat acquisition and restoration during this funding cycle.

The project is also consistent with long-term wetland goals developed by the San Francisco Bay Wetlands Ecosystem Goals Project that recommends restoration of tidal marsh in the Hill Slough area. The project also dovetails with tidal wetlands recovery efforts of the USFWS and is consistent with the visions, implementation objectives, and targets for CALFED's ERP.

A secondary benefit of implementing this restoration plan is that it continue in developing a larger scale, more contiguous restoration effort that could eventually join Hill Slough, Rush Ranch, Joice Island and Petonia Slough. Completion of this project will provide additional information on habitat restoration costs for restoring tidal wetlands in the Suisun Marsh. This will allow CALFED to accurately forecast costs of meeting the restoration targets in Suisun Marsh. In addition, landowners, wetland managers, and local communities will have become involved in the process and have a stronger understanding of CALFED's objectives.

3. System-Wide Ecosystem Benefits:

This project will benefit the system by connecting tidal wetland habitats in the upper reaches of Hill Slough. By connecting this restoration area with existing tidal habitat, the project has more value than if it were isolated. Implementation of this project will improve the health of the ecosystem functions and processes in Suisun Marsh.

APPLICANT QUALIFICATIONS

The project team for this wetlands restoration effort is composed of experienced botanists, wildlife, and fisheries biologists and specialists in the science of restoration.

ECAT Members include:

Cassandra Enos, Environmental Specialist-DWR, Patty Finfrock, Wildlife Biologist-DWR, Terri Gaines, Environmental Specialist-DWR, , Laurie Briden, Wildlife Biologist -DFG, Laureen Thompson, Wildlife Biologist- DFG, Dennis Becker, Wildlife Biologist- DFG, Frank Wernette, Senior biologist-DFG, Carissa Dunn, Environmental Specialist-USBR, Steve Chappell, Wildlife Biologist and Executive Director- SRCD. Additional participants on ECAT include Cecilia Brown, fisheries biologist- USFWS (advisory), Debra O'Leary -ACOE (advisory) and Kamyar Guivetchi, Supervising Engineer- DWR (liaison with SMPA Coordinators)

In addition to ECAT members, the following Agency staff and others will participate on this project on the implementation team, as technical advisors, or in specific monitoring activities.

Chris Enright, Senior Engineer- DWR (hydrodynamic modeling), Jean Witzman, Botanist- DWR, Leslie Millett, Fisheries Biologist- DWR, Brenda Grewell, wetlands ecologist, (technical advisor); USFWS Bay-Delta staff including Dr. Peter Baye,- Wetlands Ecologist- USFWS (technical advisor); Pam Muick, Executive Director of Solano County Farmlands and Open Space Foundation, (technical advisor).

Summary of Qualifications of Principal Participants

Terri Gaines: Environmental Specialist III, Suisun Marsh Monitoring and Compliance Section, Environmental Services Office, DWR

Education: Bachelor of Arts, Social Ecology with an emphasis in Environmental Planning, UC Irvine, June 1983
Graduate work in Watershed Management, Humboldt State University

Experience Over 8 years experience in Suisun Marsh in coordinating planning activities, preparing environmental documentation, obtaining environmental permits. Facilitator for the SMPA ECAT. Contract Manager for the Individual Ownership Management Plan Cost-Share Program. Member, Suisun Marsh Technical Advisory Committee. Implementation team participant for the Hill Slough Habitat Restoration Demonstration Project.

Frank G. Wernette Senior Biologist, Department of Fish and Game, Bay-Delta and Special Water Projects Division

Education: Bachelor of Science, Wildlife Management, California State University, Humboldt, June 1973

Experience: Supervisor of the Water Project Planning and Evaluation Unit. Responsible for the evaluation of proposed State Water Project water storage and conveyance projects throughout the State with an emphasis on the

Sacramento-San Joaquin Delta. Oversees analysis of fish and wildlife impacts associated with water project development. Currently assists the CALFED Bay-Delta Program in developing the comprehensive Ecosystem Restoration Program Plan for CALFED. Acts as the Department's technical lead in assessing fish and wildlife impacts of the Delta Wetlands Project and developing appropriate mitigation measures to offset impacts. Over 25 years experience in Suisun Marsh issues

Publications: Wernette, F.G. 1985. The 1981 Suisun Marsh Vegetation Survey. Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary. Technical Report #10. 23 p.

Chris Enright Senior Engineer, Department of Water Resources
Chief, Suisun Marsh Planning Section

Education: B.S. Environmental Engineering, Humboldt State University
Certification: Professional Engineer, Civil Engineer.
Experience: Supervisor, Suisun Marsh Planning. Responsible for evaluation and engineering analysis of salinity control measures in the Suisun Marsh. Currently assists the CALFED Suisun Marsh Levee Investigation Team with modeling analysis. Over 12 years experience planning, leading and implementing modeling analysis of hydrodynamics and water quality processes in the Sacramento-San Joaquin Delta. Co-Chair, IEP DSM2 Project Work Team. Six-year active member of IEP Estuarine Ecology Team. Member, IEP Suisun Ecological Workgroup.

COST

Budget: The cost of Phases I and II as proposed is \$1,073,500. A detailed budget for this proposal is provided as Table 1. The estimated total cost of Phases I-V as described is \$1, 989,650. A summary budget for the entire project is shown as Table 2.

Task 1: Project Management: DWR as the lead agency will provide project management and coordination of this project. Terri Gaines, as the principal investigator, will continue to recruit and coordinate the implementation and advisory teams, levee investigation team, provide contract management, complete and forward to CALFED or the appropriate agencies any subsequent documentation as specified in the PSP, and coordinate with ECAT. An email reflector will be set up to disseminate information to team members and interested parties. Completion Date: Year 1. Deliverables: CALFED status reports.

Task 2: Form an advisory or steering group: This advisory group is an interdisciplinary interagency team that will utilize and refine site selection criteria developed by ECAT and conduct detailed sited investigations with the goal of acquiring a parcel or parcels suitable for restoration. The group will frame management strategies for restoration. The core of that team has already been formed. Additional members will be added early in Phase I. Completion Date: Year 1. Deliverable: list of properties to acquire.

Task 3: Land Acquisition: the advisory team would recommend a parcel or parcels to ECAT, who in turn would recommend to the Suisun Marsh Coordinators the purchase of a parcel or parcels. Survey, mapping, appraisals and all necessary documents to transfer ownership will be conducted by DWR Division of Land and Right of Way agents. Prices offered for parcels will be in compliance with federal and state standards. Purchase will be on a willing seller basis only. Completion Date: Year 1 or 2. Deliverables: purchase contract and agreements.

Task 4: Integration with levee investigation team. Provide levee investigation team with potential properties identified for restoration. Levee Investigation team will conduct hydrodynamic modeling on potential sites to predict channel water salinity changes and potential benefits to water quality. Modeling of selected parcels would be verified using a two dimensional model under contract with RMA Associates. This verification is consistent with Levee Investigation Team protocol. Completion Date: Ongoing activity during Years 1-3. Deliverable: Modeling results.

Task 5: Develop pre-project monitoring plans. The implementation team will work with the advisory group to determine pre-project monitoring needs and develop a pre-project monitoring program. Completion Date: Year 2. Deliverables: monitoring plans.

Task 6: Develop a restoration plan. See below for components. Completion Date: Year 3. Deliverables: Restoration plan.

Subtask 6a Solicit public involvement. Through SRCD, participants on the implementation team, adjacent landowners and interested parties will be notified and invited to participate in the restoration planning effort.

Subtask 6b Complete a detailed topographic survey: If appropriate, we will complete a detailed topographic survey using 6-inch elevation increments with additional spot elevations. Deliverables: final map along with the electronic data to ECAT

Subtask 6c: Perform hydrologic and site assessment: If the implementation team feels it necessary,

a consultant would be selected to perform a complete hydrologic assessment of the site(s). The consultant would complete a report on the physical modifications required for restoration and cost estimates. Deliverables: Report and cost estimates.

Subtask 6d: Prepare monitoring plans. Monitoring plans for fisheries and other aquatic species, wildlife, vegetation, water quality, and tidal marsh development will be developed. The plans will be peer reviewed and reviewed by ECAT. Deliverable: Monitoring plans.

Task 7: Begin environmental compliance and permitting: The project applicant will start the environmental compliance and permitting required to carry out the project. Deliverables: Draft Environmental Assessment/Initial Study and draft ACOE permit application. This is a Phase III activity that may begin during year 3.

Basis for CALFED funding: The acquisitions are located in CALFED's Suisun Bay and Marsh Ecological Management Unit. Protection of this habitat through acquisition will meet several CALFED objectives and is consistent with CALFED's ERPP for several species.

Terri Gaines, DWR Environmental Specialist will perform project management functions for this project. DWR, Suisun Marsh Planning staff will conduct hydrodynamic modeling and integration with the CALFED Suisun Marsh Levee Investigation Team. This group will also coordinate verification modeling with RMA Associates, who's two-dimensional model has been used previously in Suisun Marsh.

Development of the restoration plan will be coordinated through the implementation team. Hydrologic and topographic surveys will be contracted services.

DWR and DFG biologists will develop and implement monitoring plans.

DWR Division of Land and Right of Way staff will coordinate all activities associated with land acquisition including negotiations, appraisals, survey and mapping, title search, deed preparation, recording, etc. Market value for land in Suisun is currently approximately \$1,200/acre. The budget includes an estimate for acquisition of 500 acres because a specific parcel has not been selected for purchase.

SRCD will coordinate public involvement with Suisun Marsh landowners and interested parties.

Cost-Sharing: The cost-share component of this proposal would match the requested funds from CALFED with existing Suisun Marsh Mitigation Agreement (SMMA) Funds in a 50/50 cost-share arrangement. DFG holds the SMMA cost share funds and would administer the contract.

Funds are available through the Suisun Marsh Mitigation Agreement for subsequent Phases (III-permit acquisition, IV-implementation, and V-implementation monitoring) although funding from additional sources may be sought to leverage funding.

The Suisun Marsh Preservation Agreement parties have determined that the last installment of the Suisun Marsh Mitigation Agreement funds will be allocated for multi-species management in the Suisun Marsh. The funds provided by CALFED will go beyond mitigation requirements and help leverage funding provided through the Suisun Marsh Mitigation Agreement to enable Suisun Marsh wetland Managers and ECAT agencies to restore a larger mosaic of tidal wetlands in the Suisun

Marsh.

The Suisun Marsh Mitigation Funds, as with all funds expended in the Suisun Marsh under the Suisun Marsh Preservation Agreement is cost-shared 60/40 between DWR and USBR. As a condition of the SMMA, 3.2 million dollars were transferred to DFG in October 1999. These funds were placed in an account set up specifically for Suisun Marsh multi-species management projects. Expenditures from this account can only occur after ECAT recommendation and approval by the four SMPA Coordinators.

LOCAL INVOLVEMENT

As Executive Director of the Suisun Resource Conservation District, Steve Chappell is a member of ECAT and will participate on the implementation team. As participants in the process, SRCD will provide input throughout this project, from property acquisition through implementation and monitoring. Updates of the project will be presented at monthly meetings of the SRCD Board of Directors. Once funding is secured, a local involvement plan will be prepared and public meetings will be held for SRCD members to describe the project and provide information to potential sellers.

DFG Grizzly Island Wildlife Area is also in the region of the project. Dennis Becker, Manager of the Wildlife area, is also an ECAT participant and will participate on the implementation team.

Ms. Pam Muick, Executive Director of the Solano County Farmlands and Open Space Foundation will serve as a technical advisor. SCFOSF owns and manages Rush Ranch open space in Suisun Marsh

Mr. Dennis D. Beebe, Manager for Solano County Mosquito Abatement District has been contacted regarding the proposed project and has offered to participate in the process as appropriate.

DFG has made contact with the owners of the Black Mallard Club who have expressed an interest in selling.

The following agencies have been mailed copies of this proposal. The cover letters can be found in Attachment C.

Mr. Chris Monske
Solano County Department of Environmental Management
Planning Division
601 Texas Street
Fairfield, California 94533

Steve McAdam
San Francisco Bay Conservation and Development Commission (BCDC)
50 California Avenue, Suite 2600
San Francisco, California 94111

LITERATURE CITED

CALFED Bay-Delta Program. 1999 Ecosystem Restoration Program Plan. Volumes 1 and 2. Draft Programmatic EIS/EIR Technical Appendix. June 1999

DFG, 1999a California Department of Fish and Game. The vegetation Survey for the Suisun Marsh- Proposal for a New Methodology

DFG, 1990b, California Department of Fish and Game. Salt Marsh Harvest Mouse Monitoring Proposal for the Suisun Marsh.

DWR, 2000. Department of Water Resources, Suisun Marsh Monitoring Program, Data Summary Report Reference Guide.

Goals Report 1999. Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. U.S. Environmental Protection Agency, San Francisco, Calif./S.F. Bay Regional Water Quality Control Board, Oakland, Calif.

Hieb, Kathryn and Suzanne DeLeon, 2000. Tidal Marsh Study. Interagency Ecological Program Newsletter. Vol 13, No. 1, Winter 2000.

COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

Should this project move forward, all terms and contracts will be written and submitted to CALFED for approval. The DWR is not aware of any potential conflicts of interest.

With regard to State Proposition 204 Terms and Conditions, DWR assumes that a Standard Interagency Agreement shall be used in drafting this agreement, which shall not include an indemnification provision should federal funds be used.

State Forms included:

Attachment D – Terms and conditions for State Prop 204 Funds (as modified without indemnification clause)

DWR 4187 – Standard Interagency Agreement

Federal forms included:

Attachment E- Standard USBR Financial Assistance Agreement Language (b. applies)

This contract and any modifications will require Department of General Services approval. In addition, DWR assumes the termination provision falls under 43 CFR 12.84.

Federal forms 424, 424A, 424B, D2010 are also included as part of this proposal.

THRESHOLD REQUIREMENTS

Letters of Notification to BCDC and Solano County
Environmental Compliance Checklist
Land Use Checklist

APPENDIX A

Contributions The Suisun Marsh Property Acquisition And Habitat Restoration--A Pilot Project To Implement Findings Of The CALFED Suisun Marsh Levee Investigation Team Makes To Visions, Programmatic Actions, And Objectives Of The February 1999 Ecosystem Restoration Program Plan.

Contributions The Suisun Marsh Property Acquisition And Habitat Restoration--A Pilot Project To Implement Findings Of The CALFED Suisun Marsh Levee Investigation Team Makes To Visions, Programmatic Actions, And Objectives Of The February 1999 Ecosystem Restoration Program Plan.

VISIONS

SPECIES, COMMUNITY OR LOCATION	BENEFICIAL ACTION	ERPP
Suisun Bay and Marsh Ecological Management Unit	Restoration of natural marsh features such as tidal channels to the Suisun Marsh	ERPP, Volume II, page 131
Bay-Delta Aquatic Foodweb	Restoration of additional tidal wetlands in the Suisun Marsh	ERPP, Volume I, page 98
Tidal Marsh Plant Community	Restoration of additional suitable brackish wetlands	ERPP, Volume I, page 373
Tidal Perennial Aquatic	Restoration of tidal action to diked lands	ERPP, Volume II, page 134
Essential Fish Habitat	Restoration of additional tidal wetlands	ERPP, Volume II, page 135
California Clapper Rail	Restoration of additional suitable brackish wetlands	ERPP, Volume II, page 138
California Black Rail	Restoration of marshes and emergent wetlands in the North Bay	ERPP, Volume II, page 138
Suisun Song Sparrow	Restoration of additional suitable tidal wetlands in the Suisun Marsh	ERPP, Volume II, page 138
Longfin Smelt & Splittail	Restoration of tidal wetlands of the Suisun Marsh	ERPP, Volume II, page 136
Delta Smelt	Restoration of additional tidal wetlands	ERPP, Volume II, page 134
Native Resident Fish Species, Striped Bass, Marine Fishes, Shellfish	Restoration of tidal wetlands improves water quality which helps maintain healthy fish populations	ERPP, Volume II, pages 136-137

PROGRAMMATIC ACTIONS

Bay-Delta Aquatic Foodweb	Restoration of tidal wetlands in the Suisun Bay area	ERPP, Volume II, page 144
Saline Emergent Wetlands	Return acquired wetlands to tidal action	ERPP, Volume II, page 146
California Black Rail	Restoration of additional suitable brackish emergent wetlands	ERPP, Volume I, page 249
Shorebird	Provide tidal foraging habitat	ERPP, Volume I, page 355

OBJECTIVES

Saline Emergent Wetlands	Restoration of saline emergent wetlands to the Suisun Marsh	ERPP, Volume I, page 133
Salt Marsh Harvest Mouse	Restoration of marshland habitat	ERPP, Volume I, page 261
Suisun Ornate Shrew	Restoration of tidal habitat	ERPP, Volume I, page 264
Western Least Bittern	Restoration of tidal action to aquatic habitat	ERPP, Volume I, page 309
Waterfowl	Restoration of tidal sloughs	ERPP, Volume I, page 359